



National Transportation Safety Board



## **Airplane Performance**

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# Single Engine Climb Performance

- Cessna climb rate information for the accident conditions:
  - airplane weight
  - outside air temperature
  - winds
  - altitude

**+ 200 feet per minute (fpm)**



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**Air Sunshine Flight 527, Cessna 402C, N314AB, Treasure Cay, Bahamas**

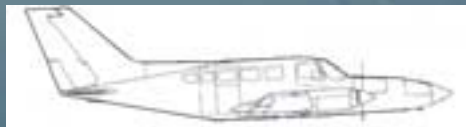
# Airplane Performance Data Available

- No radar, FDR, or CVR data
- Statements from pilot and Air Sunshine station manager
  - Point 1
    - Engine damage occurs at an altitude of 3,500 feet
    - About 20 to 25 nautical miles from Treasure Cay Airport
    - Airspeed reduced to 105 knots
  - Point 2
    - About 15 nautical miles from Treasure Cay Airport
    - 2,000 feet altitude
    - About 200 fpm descent rate
    - Airspeed reduced to 95 knots
  - Airplane wreckage was located about 7.35 nautical miles from Treasure Cay Airport

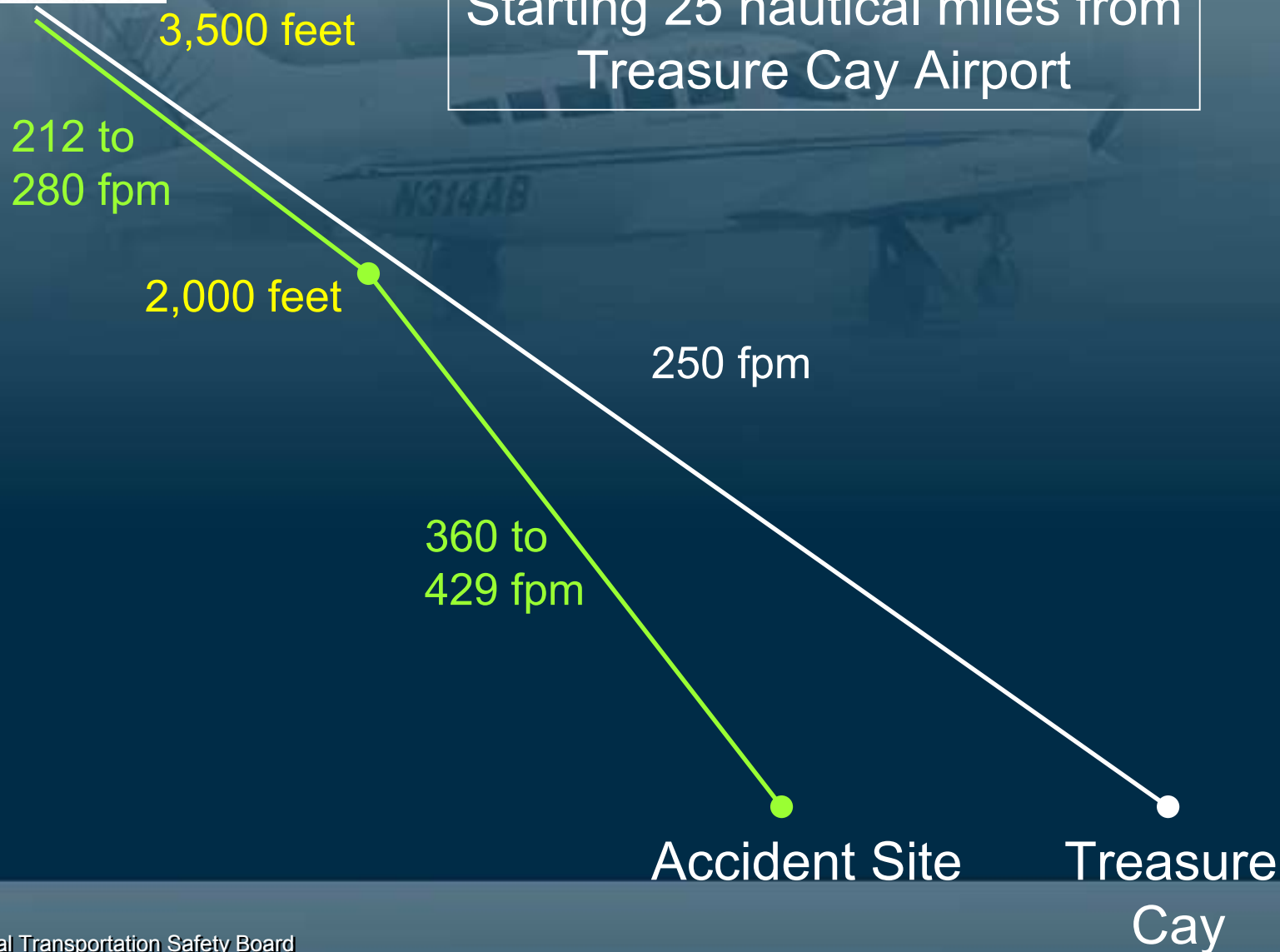


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# Average Descent Rates Starting 25 nautical miles from Treasure Cay Airport



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# Factors Contributing to Descent Rate

- Rotating propeller (versus feathered): 400 fpm
- Flaps extended to 15 degrees (versus flaps at 0 degrees): 165 to 145 fpm
- Cowl flap open on inoperative engine (versus closed): 9 fpm
- Exposed magnetos (versus undamaged engine): 4 fpm

All of these factors combined would have contributed between 558 and 578 feet per minute to the descent rate.



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# Factors Contributing to Descent Rate

- Other operational factors:
  - Operating in nonsteady descent
  - Operating at bank angle other than 5 degrees toward operative engine
  - Operating at sideslip angle other than ½-ball slip on the turn and bank indicator



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# Airplane Performance Conclusions

- Average descent rate of about 250 fpm would have resulted in airplane reaching Treasure Cay.
- Average descent rate of accident airplane below 2,000 feet was between 360 and 429 fpm.
- Maximum flight performance was not maintained because of operational factors.



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